ORIGINAL

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems	)	CC Docket No. 94-102

To: Chief, Wireless Telecommunications Bureau

COMMENTS OF U S WEST WIRELESS, L.L.C.

U S WEST Wireless, L.L.C. ("U S WEST")[1] hereby files comments in response to the Wireless Telecommunications Bureau's Public Notice of June 1, 1999, seeking additional comment on issues relating to implementation of handset-based solutions for compliance with the Commission's requirements for enhanced 911 ("E-911") Phase II Automatic Location Identification ("ALI").[2] U S WEST submits that the public interest and the Commission's underlying objectives in this proceeding are best served by affording carriers the option of implementing handset-based Phase II ALI solutions on a phased-in basis. As such, the Commission should quickly act to permit carriers to implement handset-based or so-called "hybrid" solutions through waiver grants or appropriate rule change.

BACKGROUND/INTRODUCTION

U S WEST timely submitted its petition for limited waiver of Section 20.18(e) of the rules on February 4, 1999. At the time of its original Petition, U S WEST advised the Commission that

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1 U S WEST is a broadband PCS licensee in a number of BTA markets.

2 *See Public Notice, Wireless Telecommunications Bureau Requests Targeted Comment on Wireless E911 Phase II Automatic Location Identification Requirements*, CC Docket No. 94-102, DA 99-1049 (rel. June 1, 1999), 64 Fed. Reg. 31530 (June 11, 1999) ("Public Notice").

it had not committed to a particular E-911 technology.[3] This remains the case today. To confirm, there are no commercially viable E-911 Phase II ALI solutions currently available -- whether network-based, handset-based, or hybrid -- for U S WEST's CDMA network. As discussed herein, handset-based and hybrid technologies continue to hold promise as a *potentially* lower-cost, effective alternative to network-based solutions, but such a solution can only be considered if the Commission promptly waives or modifies its rules to allow the phased-in implementation of handset-based solutions.

U S WEST has still not yet determined the solution it will use to comply with the Phase II requirements. U S WEST continues to support and provide guidance to TR45.5 standardization efforts and has already participated in and continues to be available for testing of potential solutions.[4] The standard under consideration there will support a variety of ALI technologies being developed and tested today. Three handset-based solutions currently under consideration by industry at TR45.5 are:

- ***Assisted GPS.*** This solution uses a GPS receiver integrated into the handset, assisted by messaging sent through the network between the location server and the handset. Testing by SnapTrack has demonstrated that this solution could exceed the ALI accuracy requirement of the Commission's rules, although problems remain in areas without good GPS visibility (*e.g.* "urban canyons").

- ***Autonomous GPS.*** This solution also uses a GPS receiver integrated into the handset, but does not rely on communication with a server to derive a location solution. IDC is currently developing and testing this solution which, to date, also has limits because of its requirement of and reliance on good GPS visibility.

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[3] U S WEST Wireless, L.L.C., Petition for Waiver filed Feb. 4, 1999. In that filing, U S WEST alternatively requested a rule change to permit compliance via a handset-based solution. Based on the widespread interest in this issue, U S WEST submits that a rule change may be more appropriate.

[4] The TIA TR45.5 group formed a separate Ad Hoc group in November 1998 to merge the multiple CDMA location standards proposals from manufacturers, and on May 17, 1999, a baseline standards text was completed to support transport of location signaling messaging on the traffic channel. Additional standards work is still required to incorporate this messaging standard into an open standard for signaling/interface to the network location server.

- ***Hybrid.*** Like Assisted GPS, this solution uses a GPS receiver integrated into the handset, "assisted" by messaging sent through the network between the location server and the handset, but also uses information from the network infrastructure to augment GPS information. Thus, for example, instead of requiring visibility with 4 satellites for triangulation, other configurations -- such as 3 satellites and information from 1 cell site, or 2 satellites and information from 2 cell sites -- will work. This will enable location solutions in more areas than GPS alone, and may hold the most promise because it takes advantage of assisted GPS information and information available from the network infrastructure. If no GPS information is available, this solution could attempt to use information from the network infrastructure alone, but with less accuracy.[5] Testing by Qualcomm indicates that this method could exceed the Commission's ALI accuracy standard.

The TR45.5 standard under consideration will also support other solutions receiving less consideration, including Auxiliary/External GPS and Enhanced Forward Link Triangulation.[6]

U S WEST is discussing various solutions with vendors and reviewing test results, and has formally released a Request for Information for such solutions. Despite these efforts, U S WEST and other CDMA carriers in particular remain in a very difficult position in that while the October 1, 2001 deadline is approaching, no Phase II solution is yet commercially available; moreover, network-based solutions have reported little progress with respect to CDMA technologies. U S WEST submits that, based on current developments, the technology-neutral approach advocated herein provides maximum flexibility in this area and will best serve the public interest.

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[5] *See infra* note 6 (discussion of Enhanced Forward Link Triangulation).

[6] Auxiliary/External GPS could potentially be used to "retrofit" legacy handsets that do not have integrated GPS, but a number of technical obstacles must be resolved, including the mechanics of adding the GPS receiver/antenna to the back of an existing handset, data connectivity required from the external GPS pack to the phone, and new handset software; thus far this option appears potentially very expensive and unwieldy. Enhanced Forward Link Triangulation ("EFLT") uses information derived from the network infrastructure only and is limited in a mobile multipath environment and in areas where there are fewer than 3 surrounding cell sites. U S WEST is not pursuing EFLT as an option, as testing indicates that EFLT thus far will not meet the ALI accuracy standard of the Commission's rules. U S WEST does not object to giving carriers the flexibility to, if feasible, implement EFLT as an alternative "back-up" to a hybrid or handset-based solution, akin to Sprint's proposal. *See* Public Notice at 6.

U S WEST and other carriers intend to comply with Phase II requirements and are working to meet their obligations. To that end, U S WEST does not object to the adoption of performance or deployment benchmarks but, as discussed herein, given carriers' dependence on vendors for the availability of ALI-capable handsets and inevitable consumer demand fluctuations, a carrier's good-faith efforts to meet such benchmarks should be the standard for determining compliance with the Commission's E-911 Phase II requirements. Inflexible benchmarks may force carriers to adopt ALI solutions that are more costly and/or less accurate, to the detriment of consumers. For its part, the Commission should *expeditiously* waive or amend its rules to facilitate alternative compliance via handset-based solutions to provide carriers certainty and to help ensure the viability of promising handset-based and hybrid solutions. Finally, U S WEST supports use of circular error probability ("CEP") methodology for ALI compliance purposes.

DISCUSSION

I. BENCHMARKS FOR PHASE II COMPLIANCE

In previous filings, U S WEST has requested a limited industry-wide waiver of Section 20.18(e) that would deem CMRS licensees in compliance with the Phase II implementation deadline if ALI-capable handsets which exceed Phase II requirements are offered for sale prior to October 1, 2001. Other parties made similar requests, seeking to give carriers the flexibility to utilize such solutions if it is determined that they are economically and technically feasible.

The Commission now seeks public comment on proposals submitted by SnapTrack and APCO pursuant to which carriers would be deemed in compliance if they meet certain bench-marks. U S WEST does not oppose the use of benchmarks, but given that carriers are dependent on their vendors for the availability of ALI-capable handsets and/or equipment, and that the demand for wireless products varies throughout the course of a calendar year, a carrier's meeting such benchmarks should be considered an indicia of compliance rather than a *per se* violation of

the rules. Moreover, given projections for rapid handset churn, carriers should be given the flexibility to rely on either initial deployment benchmarks *or* penetration level benchmarks as a basis for measuring compliance with the Commission's E-911 Phase II requirements.

A. Initial Deployment of ALI-Capable Handsets

U S WEST does not object to the Commission's adoption of a benchmark date as a *target* for commencing the deployment of ALI-capable handsets. Again, a carrier's good faith efforts to comply with benchmarks for initial deployment of ALI-capable handsets should be sufficient for purposes of compliance with the Commission's E-911 Phase II rules. Moreover, penetration level benchmarks, if adopted, should be an alternative to -- and not supplement -- initial deployment benchmarks.

Both SnapTrack and APCO propose that carriers opting for a handset-based solution begin to deploy ALI-capable handsets by January 1, 2001 -- in advance of the October 1, 2001 compliance date for the Commission's rules.[7] At this point, U S WEST anticipates that due to the need for standards development and testing, such handsets will not be available until early April 2001 -- *i.e.*, early 2Q2001. While it is conceivable that U S WEST will have committed to purchasing such handsets by 1Q2001, availability to consumers at the retail level is not likely to occur until a few months after the proposed January 1, 2001 date. Thus, any rule change or waiver standard the Commission adopts for initiating deployment of ALI-capable handsets should be deemed an indicia of compliance, rather than a *per se* violation if a carrier acts in good faith to comply with Phase II requirements. Importantly, any benchmark date should be tied to the expeditious release of a Commission *Order* granting the waiver requests or amending the rules.[8]

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[7] *See* APCO Further Comments at 2-3; SnapTrack at 4; 47 C.F.R. § 20.18(e).

[8] APCO itself recognizes that the timing of release of an *Order* in this proceeding may affect the timing and/or achievability of its proposal. *See* APCO Further Comments at 2 n.2.

SnapTrack also proposes that carriers be required to deploy only ALI-capable handsets after December 31, 2001, while APCO proposes that at least 80 percent of handsets deployed be ALI-capable as of December 31, 2001 and 100 percent ALI-capable by December 31, 2002. As a threshold matter, 100 percent deployment by the end of 2001 is simply not feasible. As APCO notes, there will already be many non-ALI capable handsets in the retail market by the time that ALI-capable handsets can be deployed.[9] While APCO's 80 percent figure is more realistic than SnapTrack's, and even APCO's proposed December 31, 2002 benchmark may be feasible, there remain uncertainties regarding the timing of availability of ALI-capable handsets from vendors.

Again, benchmarks for handset deployment should be deemed an indicia of compliance, rather than a *per se* violation. Commission-imposed sanctions are not appropriate if a carrier makes good faith efforts to comply. Finally, reliance on U S WEST's proposed penetration levels (discussed *infra*) will over time further the objectives inherent in the proposed initial deployment benchmarks without being subject to the uncertainties of initial vendor equipment availability.

B. Penetration Levels

APCO also proposes that carriers meet specific penetration levels for ALI capable phones such that certain percentages of all phones in use on a carrier's system must be ALI capable by specific dates. Specifically, under the proposal, 25 percent of all phones on a carrier's system would need to be ALI-capable by December 31, 2002, 50 percent by December 31, 2003, 75 percent by December 31, 2004, and 99 percent by December 31, 2005.[10] U S WEST submits that, subject to commercial availability of ALI-capable handsets and prompt release of an *Order* in this proceeding, a more appropriate benchmark would be a target of 85 percent penetration by December 31, 2005.

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[9] *Id.* at 2-3.

[10] *Id.* at 3.

Competition among carriers, as APCO notes, will result in the rapid replacement of non-ALI capable handsets already in the marketplace. Compliance with these benchmarks, however, is vulnerable to factors outside carriers' control and, in this regard, 100 percent penetration will likely never be possible in any event -- *not* for technological reasons, but simply because some consumers, given the option, will affirmatively decline to upgrade their handsets or to purchase ALI-capable handsets. Historical data confirm that 100 percent penetration of any new technology is unlikely. Penetration levels also are subject to the commercial availability of such handsets from vendors and to consumer demand for handsets -- which typically vary during a given year.[11] Thus, as with handset deployment, benchmarks for handset deployment should be deemed an indicia of compliance, rather than a *per se* violation. A carrier's good faith efforts to meet this benchmark should be deemed sufficient. Again, U S WEST expects that because of handset churn projections, carriers will be able to achieve high penetration levels quickly.

C. Accuracy Standards

Section 20.18(e) of the Commission's requires accuracy of 125 meters or less using a Root Mean Square ("RMS") methodology. The Commission seeks comment on alternative accuracy standards for handset-based solutions. SnapTrack recommends that carriers using handset-based solutions be able to achieve accuracy of 90 meters using circular error probability ("CEP") methodology. APCO recommends more generally that carriers should commit to "a specific average accuracy level substantially better than the current Phase II requirement . . . based on its best estimate of technological capabilities."[12]

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[11] *See First Quarter Sub Growth Down from Holiday Rush, to Varying Degrees*, PCS WEEK, Apr. 28, 1999; *Industry Repeats Fourth Quarter Blowout; Wireless Impact on Overall Numbers Grows*, PCS WEEK, Feb. 3, 1999.

[12] APCO Further Comments at 3.

U S WEST does not object to a requirement that carriers using a handset-based solution be able to provide ALI more accurately than that currently required in the Commission's rules. Indeed, U S WEST's original waiver request was contingent on the availability of handsets that exceed the current Phase II ALI requirements prior to the October 1, 2001 deadline.[13] In this regard, handset-based vendors, such as SnapTrack, continue to test GPS-based technologies for CDMA carriers, most recently in Tampa, Florida with Sprint PCS and GTE.[14] While the Tampa testing does not reflect performance for certain environments, such as "urban canyons," mountainous terrain and basements, the technology continues to show considerable promise. IDC recently conducted similar testing with a number of CDMA carriers in the Seattle area and, while encountering similar limitations, largely exceeded the Commission's accuracy standards.[15] U S WEST is also considering the feasibility of a "hybrid" solution, being developed by Qualcomm.

Based on information from vendors, U S WEST understands that, once commercially available, handsets utilizing GPS-based ALI technologies may be consistent with or exceed the standards suggested by AirTouch and SnapTrack which -- again, if available -- would "substantially exceed" ALI accuracy requirements of the Commission's rules.[16] U S WEST cautions, however, that additional testing in certain environments will be required, and certain technical issues must be resolved before carriers can commit to *any* handset-based solution.

II. ROAMING AND HANDSET TURNOVER

The Commission has requested additional information regarding the extent of roamers who may not have ALI-capable handsets, handset turnover, issues and the usefulness of Phase I

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13 *See* U S WEST Petition at 5.

14 *See* SnapTrack *Ex Parte* Presentation, June 2, 1999, Exhibit G.

15 *See* IDC *Ex Parte* Presentation, May 28, 1999, at 2.

16 *See* APCO Further Comments at 3; 47 C.F.R. § 20.18(e).

location information as a back-up. The Commission further expressed concern for ALI availability for customers who do not replace handsets frequently, and requested comment on the potential timing and costs of a retrofitting or replacement obligation to encourage customers to replace such legacy handsets. Handset churn, together with carrier marketing and education efforts, will facilitate the rapid deployment of ALI-capable handsets into the marketplace, and thus the Commission need not be concerned in this area. As discussed above, a 100 percent penetration level is not feasible, in part due to the fact that some consumers will simply opt against purchasing ALI-capable handsets. Nevertheless, it is clear that carriers have significant market-based incentives to rapidly deploy ALI-capable handsets. Marketing and promotional efforts, along with equipment turnover, will assure rapid market penetration of ALI-capable handsets.

Further, the minimal expected impact of phased-in implementation on the availability of ALI services in the marketplace must be weighed against the possible absence of an economically or technically viable network-based solution for carriers. "Flash cut" implementation of a network-based solution can work *only if such a solution is commercially available and is technically and economically feasible.* While U S WEST continues to consider the feasibility of network-based solutions, there has not been much testing of network-based solutions for CDMA systems and the viability of such solutions remains uncertain. Again, there is no commercially available network solution for CDMA systems.

III. METHODOLOGIES FOR DETERMINING ALI ACCURACY

The Commission seeks comment on arguments submitted by various parties regarding RMS and CEP accuracy standards. For reasons discussed by other parties in this proceeding, CEP is a more accurate method for representing the probability of being within a circle with a certain

radius.[17] Thus, U S WEST supports the use of CEP rather than RMS for purposes of determining Phase II compliance.

CONCLUSION

As discussed herein and in U S WEST's earlier filings, the Commission should waive or amend its rules to authorize CMRS carriers to implement handset-based Phase II solutions.

Respectfully submitted,

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[17] *See* Ericsson *Ex Parte* Presentations of April 6, 1998 and March 20, 1998.